Appendix H. Noxious Weed Management Plan

Natural Gas Facilities in the Bull Mountain Unit
SG Interests I, Ltd. Montrose, CO
December, 2010

1.0 Introduction

This Noxious Weed Management Plan (plan) identifies measures to be taken by SG Interests I, Ltd. (SG) and its contractors (Contractor) to minimize the spread and establishment of noxious weeds and non-native invasive species.

Measures identified in this plan apply to work within the project area defined as well pads, pipeline rights-of-way, access roads, temporary use areas, and other areas used in association with the natural gas development within the Bull Mountain Unit and adjacent areas in Gunnison County.

1.1 Purpose

SG is committed to preventing the introduction of noxious weeds during construction and controlling the expansion of existing noxious weed populations over the life of the project. All noxious weeds as defined by Gunnison County and the state of Colorado (Colorado Weed Management Act CRS Title 35, Article 5.5 as amended) will be controlled. The purpose of this plan is to prescribe methods to treat existing weed infestations, prevent introduction and spread of infestations during construction, and monitor and treat infestations after construction is complete.

2.0 Noxious Weed Management

2.1 Weed Identification

The following noxious weeds are listed noxious weeds in the state of Colorado or in the Gunnison Basin Weed District Management Plan. The goal for Colorado A Listed weeds is eradication. The goal for B Listed weeds is to stop their spread. C Listed weeds are those weeds that are managed by local jurisdictions within the state of Colorado.

Table 2.1-1. Noxious weeds and appropriate controls

Weed Name	Scientific Name	Gunnison Co. Listed	Colorado List (A, B, or C)
Absinth wormwood	*Artemisia absinthium*	√	B
African rue	*Peganum harmala*		A
Black henbane	*Hyoscyamus niger*	√	B
Bull thistle	*Cirsium vulgare*		B
Burdock	*Arctium minus*		C
Camelthorn	*Alhagi pseudalhagi*		A
Canada thistle	*Cirsium arvense*		B
Chicory	*Chichorium intybus*		C
Common crupina	*Crupina vulgaris*		A
Common St. Johnswort	*Hypericum perforatum*		C
Cypress spurge	*Euphorbia cyparissias*		A
Dalmation toadflax	*Linaria dalmatica*	√	B
Dame's rocket	*Hesperis matronalis*	√	B

Weed Name	Scientific Name	Gunnison Co. Listed	Colorado List (A, B, or C)
Diffuse knapweed	*Centaurea diffusa*	√	B
Dyer's Woad	*Isatis tinctoria*		A
Field bindweed	*Convolvulus arvensis*	√	C
Giant salvinia	*Salvinia molesta*		C
Halogeton	*Halogeton glomeratus*		C
Hoary cress	*Cardaria draba*	√	B
Houndstongue	*Cynoglossum officinale*		B
Hydrilla	*Hydrilla verticillata*		A
Jointed goatgrass	*Aegilops cylindrica*		B
Leafy spurge	*Euphorbia esula*	√	B
Meadow knapweed	*Centaurea pratensis*		A
Mediterranean sage	*Salvia aethopis*		A
Medusahead	*Taeniatherum caputmedusae*		A
Myrtle spurge	*Euphorbia myrsinites*		A
Musk thistle	*Carduus nutans*	√	B
Orange hawkweed	*Hieracium aurantiacum*	√	
Oxeye Daisy	*Chrysanthemum leucanthemum*	√	B
Plumeless thistle	*Carduus acanthoides*	√	B
Poison hemlock	*Conium maculatum*		C
Puncturevine	*Tribulus terrestris*		C
Purple loosestrife	*Lythrum salicaria*	√	A
Rush skeletonweed	*Chondrilla juncea*		A
Russian knapweed	*Centaurea repens*	√	B
Russian olive	*Elaeagnus angustifolia*		B
Sericea lespedeza	*Lespedeza cuneata*		A
Scotch thistle	*Onopordum acanthium*	√	B
Spotted knapweed	*Centaurea maculosa*	√	B
Squarrose knapweed	*Centaurea virgata*		B
Tamarisk	*Tamarix parviflora, T.ramosissima*	√	B
Tansy ragwort	*Senecio jacobaea*		A
Yellow starthistle	*Centaurea solstitialis*		A
Yellow toadflax	*Linaria vulgaris*	√	B

2.2 Preventative Measures

The following preventative measures will be implemented to prevent the spread of noxious weeds:

- If soil stockpiles are created in infested areas, these stockpiles will be kept as close as possible to the infested areas. No soil from infested areas will be moved until they are leveled and used. Soil from an infested area will not be used in any other area beside where it was collected.
- Vehicles and equipment will be required to arrive at the work site clean, power-washed, and free of soil and vegetative debris capable of transporting weed seeds or other propagules.
- Materials used for erosion control and reclamation (i.e. straw bales and seed mixes) will be obtained from sources that are weed-free. Seed mixes will also be weed free.

- Disturbed areas will be reseeded in accordance with the Surface Use Agreement and any applicable permit stipulations as soon as possible after construction activities have been completed.

2.3 Weed Treatment Measures

Depending upon the species of weed and the time planned for construction, methods of weed pre-treatment may include:

- Mechanical—mowing, pulling by hand, or tillage could be used.
- Chemical—application of an approved herbicide by a licensed applicator. Herbicides will be selected based on recommendations by local weed control district or BLM/FS and subject to fee-landowner approval. All herbicides will be applied in accordance with all applicable laws and regulations on BLM/FS and fee-lands.
- Cultural – employing practices such as reseeding with non-invasive species that can outcompete noxious species. This type of treatment will be conducted in some fashion on all disturbed areas associated with the project.

Effective control measures vary for different weed species. For many species, a combination of measures should be employed to be most effective. The following table lists the known and potential weeds within the Bull Mountain Unit as well as the best control measures for each.

Table 2.3-1. Noxious weeds and appropriate controls

Weed Name	Herbicide Used?	Herbicide details	Mechanical measures used?	Type of mechan. control	Cultural Control Used?	Type of cultural control
Bull thistle	Yes (ex. Tordon)	Spray rosettes in early spring	Yes	Removal of rosettes and mowing of bolting plants	Yes	Seeding w/desirable species
Burdock	No	NA	Yes	Sever tap root	Yes	Seeding w/desirable species
Canada thistle	Yes	Mow then spray in late summer or fall	Yes	Mowing prior to spraying	Yes	Seeding w/desirable species
Chicory	Possibly	Contact county specialist	No	NA	Yes	Seeding w/desirable species
Common St. Johnswort	Yes(ex. Roundup Ultra)	Spray green plants, preflower-ing	No	NA	Yes	Seeding w/ desirable species
Dalmation toadflax	Yes (ex. Tordon K)	Herbicide w/surfacet-ant in early stages	Yes	Hand grubbing during summer	Yes	Seeding w/ desirable species
Diffuse knapweed	Yes	Spray at rosette stage	Yes	Hand pulling of rosettes and plants early in bolting stage	Yes	Seeding w/desirable species
Dyer's Woad	Yes	Spray rosettes in	Yes	Hand pull bolting plants, bag any heads	Yes	Seeding w/desirable

Weed Name	Herbicide Used?	Herbicide details	Mechanical measures used?	Type of mechan. control	Cultural Control Used?	Type of cultural control
		spring or fall				species
Field bindweed	Yes (ex. Roundup Ultra)	Spray green plants, early flowering stage	No	NA	Yes	Seeding w/desirable species
Halogeton	No	NA	No	NA	Yes	Seeding w/desirable species
Hoary cress	Yes	Spray pre or early bloom stage	No	NA	Yes	Seeding w/desirable species
Houndstongue	Yes	Spray prebud or rosette state	Yes	Hand pull after bolting stage, if flowers bag heads	Yes	Seeding w/desirable species
Jointed goatgrass	No	NA	Yes	Mow just after seed heads form	Yes	Seeding w/desirable species
Leafy spurge	Yes (ex. Tordon 22K)	Spray in spring pre flowering and in fall	No	NA	Yes	Seeding w/desirable species
Mediterranean sage	No	NA	Yes	Cut flowering plants and bag heads	Yes	Seeding w/desirable species
Musk thistle	Yes (ex. Tordon 22K)	Spray rosettes and early bolting stages	Yes	Hand pull, sever tap root, bag heads, mow large infestations at bolting or early flowering	Yes	Seeding w/ desirable species
Oxeye Daisy	Yes	Spray preflower-ing stage	No	NA	Yes	Seeding w/desirable species
Plumeless thistle	Yes (ex. Tordon 22K)	Spray rosette to early bolting stage	Yes	Sever tap root, bag heads, mow large infestations bolting to early flower stage	Yes	Seeding w/desirable species
Poison hemlock	Yes (ex. phenoxy herbicides or glyphosate)	Spray young plants	No	NA	Yes	Seeding w/desirable species
Puncturevine	Yes (ex. chlorsulfur-on and 2, 4-D)	Chlorsulfur-on preemerg-ence and 2, 4-D , soon after emergence	Yes	Cut or hoe plants prior to seeding, bag any heads	Yes	Seeding w/desirable species
Purple loosestrife	Yes (2,4-D and glyphosate)	Spray in spring preflower-	Yes	Hand pull small plants, mow larger infestations	Yes	Seeding w/desirable species

Weed Name	Herbicide Used?	Herbicide details	Mechanical measures used?	Type of mechan. control	Cultural Control Used?	Type of cultural control
		ing fall spraying w/removal of flower heads				
Russian knapweed	Yes (ex. Curtail)	Spray in bud to bloom stage in summer and fall	No	NA	Yes	Seeding w/desirable species
Russian olive	Yes (ex. Garlon)	Spray cut stump or apply to basal bark	Yes	Cut trees down or cut basal bark (follow up with chemical treatment)	Yes	Seeding w/desirable species and plant willow cuttings, Carex plugs
Scotch thistle	Yes (ex. Milestone)	Spray rosettes using surfactant added spray	Yes	Dig rosettes, sever root	Yes	Seeding w/desirable species
Spotted knapweed	Yes (ex. Tordon 22K)	Spray rosettes	No	NA	Yes	Seeding w/desirable species
Tamarisk	Yes (ex. Garlon 4)	Paint stump w/herbi-cide, spray sprouts, use basal bark treatment for small diameter trees	Yes	Cut tree (follow up with chemical treatment)	Yes	Seeding w/desirable species, plant willow cuttings, Carex plugs
Yellow starthistle	Yes (ex. Tordon 22K)	Spray rosettes & early bolting stages	Yes	Hand pull small infestations	Yes	Seeding w/desirable species
Yellow toadflax	Possibly	Consult specialists	Possibly	Consult specialists	Yes	Seeding w/desirable species

Best Management Practices for the Noxious Weeds of Mesa County recommendations with some herbicide recommendations from 2006 North Dakota Weed Control Guide (http://www.ag.ndsu.edu/weeds/w253/w253w.htm) and additional information from Weed Control Methods Handbook: Tools and Techniques for Use in Natural Areas, The Nature Conservancy.

If any soil stockpiles are maintained for longer than 90 days, these stockpiles will be treated for weeds.

3.0 Reseeding

3.1 Seed Mix

The seed mix will be chosen by the landowner, stipulated in permit conditions of approval, or dictated by the surface management agency. Some possible seed sources are:

- Arkansas Valley Seed Solutions 877-957-3337; 4625 Colorado Blvd, Denver, CO 80216
- Pawnee Butte Seed Co. 970-356-7002; P.O. Box 1604, Greeley, CO 80632
- Sharp Bros, Seed Co. 800-421-4234 104 East 4th Street Road Greeley, Colorado 80631
- Southwest Seed, 13260 County Road 29, Dolores, CO 81323

3.2 Planting Schedule

Areas slated for reclamation will be returned to near pre-construction grades and contours. Topsoil will then be replaced over the disturbed area from which it was stripped.

Final cleanup after work in waterbodies and wetlands (primarily associated with pipeline installation) will be concluded, seeding accomplished, and mulching or erosion control mats installed, prior to the end of the following time frames.

- waterbodies—24 hours after initial in-stream disturbance
- wetlands—within 10 days of backfilling in that wetland

There are exceptions to these time frames, as noted below:

- Seeding and installation of erosion control matting may be deferred until final cleanup (i.e., temporary bridge is removed and waterbody banks across the travel lane are restored to pre-construction conditions) if the streambanks and all disturbed slopes above the waterbody are stabilized with an application of mulch extending 25 feet up the slope.
- If reclamation and seeding is deferred more than 10 days after final grade restoration near waterbodies and wetlands, all disturbed slopes above waterbodies and wetlands will be temporarily stabilized by applying straw mulch for a minimum distance of 200 feet above the edge of the waterbody or wetland. Wetlands will not be seeded unless noxious weeds are present. Successful recolonization by wetland species is generally related to effective topsoil salvage methods and sources of seed and rhizomes in adjacent areas. Streambanks will be seeded immediately upon completion of final cleanup.
- Specific permit conditions may alter the wetland and waterbody timelines.
- Weather constraints may alter the time frames.

3.3 Seeding Methods and Procedures

SG's contractor will employ broadcast or drill seeding as site conditions allow. Seeding activities will be contingent upon weather and soil conditions. Seeding will not be permitted if there is more than 2 inches of snow on the ground unless approved by the surface landowner or surface management agency. On BLM/FS lands and where approved by the fee-landowner, the contractor will randomly distribute any windrowed trees and shrubs or other remaining vegetation debris over the right-of-way (after seeding) by hand or appropriate equipment so as not to disturb the seedbed.

Drill seeding is the preferred seeding method and will be employed wherever soil characteristics and slope allow effective operation of a rangeland seed drill. Drill seeding will be performed perpendicular to the slope. Seed will be placed in direct contact with the soil at an average depth of 0.5-inches, covered with soil, and firmed to eliminate air pockets around the seeds. Seed will be applied using a rangeland seed drill with a seed release and agitation mechanism sufficient to allow seeds of various sizes and densities to be planted at the proper seeding depth.

Broadcast seeding will be employed only in areas where drill seeding is unsafe or physically impossible. Seed will be applied using manually operated cyclone-bucket spreaders, mechanical spreaders, or blowers. Seed will be uniformly broadcast over disturbed areas. Broadcast application rates will be twice that of drill rates. Seed will be applied so that uniform coverage of 20 seeds per square foot is obtained. Immediately after broadcasting, the seed will be uniformly raked, chained, dragged, or cultipacked to incorporate seed to a sufficient seeding depth. If the area is seeded prior to a soil crust forming, harrowing or raking may not be necessary.

3.4 Evaluating Reclamation Success

SG will conduct intensive monitoring after the first growing season in accordance with Colorado Discharge Permit System (CDPS) requirements. Monitoring will occur routinely thereafter to assess soil stability and revegetation success (as required by CDPS permit).

4.0 Monitoring

SG will continue to monitor the distribution and density of noxious weeds for the life of the project. Surveys will be conducted concurrently with reclamation monitoring and will occur as early in the year as feasible to identify and control noxious weeds before they produce seed. Monitoring data collected will include the noxious weed species, location, and extent of infestation. At locations where new populations have been identified or pre-existing populations have expanded, SG will take action to eradicate the population or control their spread. The selection of control methods will be based on the available technology and information of the weed species.